- COPY FOR EDITING, Dec 15, 2014 (Please use Track-Changes) Bjh
- Comments from Jean Brochi received on Jan.12, 2015 in Yellow.
- Jean Brochi comments flagged in BLUE were not made after listening to the original voice recording (i.e., original transcript was correct).

SUPPLEMENTAL ENVIRONMENTAL
IMPACT STATEMENT

Suffolk Community College
20 East Main Street
Riverhead, New York
3:00 p.m.
December 8, 2014

S P E A K E R S:

BERNWARD J. HAY, PH.D, The LOUIS BERGER GROUP, INC.
JEAN BROCHI, Project Manager, EPA, Region I
FRANK BOHLEN, UCONN
GRANT MCCARDELL, UCONN

A U D I E N C E   S P E A K E R S:

ADRIENNE ESPOSITO, Citizens Campaign for the Environment
MARGUERITE PURNELL, Fishers Island
BILL GASH, Connecticut Maritime Coalition
KEVIN MCALLISTER, Defend H2O

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DR. HAY: I think we are ready to start. Welcome to this public meeting. Good afternoon. Before we start, a couple of housekeeping items. The sign is sheet outside. I hope everyone has had a chance to sign in at this point. The public rest rooms are on the right side down the corridor, both ladies' room, men's room. Also, please turn off your cell phones or put them on vibrate.

My name is Bernward Hay. I am with the Louis Berger Group. We are under contract with the University of Connecticut, which is under contract to the Connecticut Department of Transportation. We have been assisting the Connecticut Department of Transportation and the EPA to prepare a Supplemental Environmental Impact Statement for the potential designation of one or more dredge material disposal sites in open waters. The EPA is the federal lead agency for this project. In addition to this public meeting, there will be another one tomorrow, which will be held in New London, Connecticut.

Today's meeting is designed to present findings of the physical oceanography study that was conducted as part of the Environmental Impact Statement. This meeting will be informational, and there will be a presentation. Therefore, there is no comment period, but we do have time for questions and comments at the end of the presentation as well.

Ms. Jean Brochi is the project manager of the Ocean and Coastal Protection Unit of the EPA. She will open the meeting, and will give you a project update. Then this will be followed the physical oceanography presentation by Frank Bohlen and Grant McCardell from the University of Connecticut Marine Science Department. Again then we will have some time for questions and for comments.

The meeting is recorded by a stenographer, and also on audio devices, and the transcript will be available. After the meeting at some point, it will be made available to the public on their web site, at the EPA's web site. With this, Ms. Brochi will open the meeting.

MS. BROCHI: The other speakers probably won't need a microphone, but I do. Even with the microphone, if you can't hear me, please just raise your hand or ask me to repeat something.

Anyway, thank you all for coming out this afternoon on this wonderful winter day. If you haven't been to a meeting before, this is an EPA meeting, and it is a combined EPA Region I and Region II. We have several EPA representatives here. I am Jeanie Brochi, as Bernward said. Mel Cote, my manager is here. Doug Pabst and Pat Pechko from Region II, and Alicia Grimaldi, who you met when you first signed in, is also from our office in Region I.

This is for a Supplemental Environmental Impact Statement for Eastern Long Island Sound. The last set of public meetings that we had in this facility, actually, was in June, June 25th and 26th. Again, the primary focus of this meeting is for the physo study, and Frank Bohlen will start that off.

Again, under the Marine Protection and Research Sanctuaries Act and the Clean Water Act, EPA and the Corp of Engineers share responsibility for dredge material management. Several Corp of Engineers personnel are here today. Under Section One of Two of the Marine Protection and Sanctuaries Act, EPA has the authority to designate disposal sites for dredged material.

The Long Island Sound Dredge Materials Disposal Site designation was officially, the final designation was in July of 2005, and that was for the western and central disposal sites. The Corp has the authority to select sites on a temporary basis. So Cornfield Shoals and New London disposal sites, which are at the eastern part of the Sound, were selected by the Corp of Engineers, and expire in 2016.

Here are the disposal sites. You can see the Western, Central and this meeting is focusing on the Eastern sites. Again, our role is to designate disposal sites. In doing so, we develop a site management and monitoring plan. EPA also has a shared role in reviewing dredging permits, but an applicant would apply to the Corp of Engineers for a federal permit.

We are initially reviewing the Environmental Impact Statement looking at site screening, and there were site screening criteria

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both general and specific in the Marine Protection, Research and Sanctuaries Act, which we followed. I didn't go into detail here, but I do have the presentation that went into detail from the June meeting.

Initially, we had the 11 sites in Eastern Long Island Sound. Now we are focusing on six sites, which include Cornfield, New London, Niantic, Orient Point, Clinton and Six Mile Reef. The physical oceanography study, results and a presentation will be made today initiated with some additional buoy locations, and the green shows the buoy locations, the labels show the historic sites, and the labels that are not in yellow show the dredge material disposal sites.

This process kicked off with a Notice of Intent in October of 2012. We have had several cooperating agency and public meetings, as I mentioned. One of the last public meetings, Sarah Anker's office recommended that EPA and the Corp start educational webinars to talk about dredging, the process of dredging and some dredge

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material equipment. We held one webinar so far, and it was on April 3rd. It was well attended. So we want to thank any representatives, if you are here. Thank you.

If you didn't sign in, please do so. But if you did, and you want to comment after this meeting, or you have questions, feel free to send them to the ELIS at EPA.gov E-mail system. If you are not on our notification system about upcoming meetings, please feel free to sign up for that. We also have the minutes from the meetings, and we will have all the documents posted on our EPA Region I web site. The address is http: http://www.epa.gov/region1/eco/lisdreg/elis.html

The next step in this process is the further evaluate the site, draft rule making, and a draft a supplemental Environmental Impact Statement by spring 2015. We will hold additional public meetings at that time, and will hold official comment periods on the draft, and the draft rule making.

Assuming that the SEIS recommends

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designation on one or more sites, then we will move forward with the final SEIS and rule making. That would be no later than December 2016.

With that, I am going to introduce Frank for the physical oceanography presentation.

DR. BOHLEN: Good afternoon. Can you hear me? If you can't, speak up. I am Frank Bohlen. I am a physical oceanographer at the University of Connecticut Department of Marine Sciences. I have been working on sediment and sediment transport for 45 years. A fair amount of that work has been done around dredge material disposal sites, dredging and dredge material disposal sites.

We have seen the evolution of information over the past 45 years, and there has been, believe it or not, a substantial evolution. I want to emphasize that we are going to be talking about the physical oceanography, physical oceanography of Long Island, as in physics. Not the biological, not the chemical, neochemical nor the political. Physical oceanography.

We are going to be talking about the physical oceanography in the Zone of Siting

Feasibility. We will try to define that. By the way, if at any time you don't understand the language, don't be afraid to speak up, because we often tend to speak our own language. It is taken for granted that everybody knows where Staten Island is, sort of thing. Then you come out after the talk, and you find out that nobody knows where Staten Island is. Holy Christmas. So that doesn't work. Don't be afraid to ask the question if you don't understand the language.

Physical oceanography in the Zone of Siting Feasibility. Why? Because one of the first questions that is often asked is, is the stuff going to stay put, and under what circumstances might it not stay put, and if it doesn't stay put, where is it going to go. So it makes sense to begin with the physics. Besides the fact that it is the queen of the sciences, so the remaining sciences are only the handmaidens of the queen.

We are going to speak about the model that is being developed and being used. Why four? We can't measure all we need to know at every point through the Zone of Siting

Feasibility. We can measure characteristics at a number of discreet points, hopefully selected discrete points, and then use that to build a model that will allow us to really assess on a much finer spatial scale than we could ever hope to do by measuring.

A model is important today in practically everything we do. We wake up in the morning and we look at the weather forecast, it's a model. We are going to be using a model, a development model. Then we are going to evaluate the model. How good are the simulations presented by the model. It will give you some indication of what the results indicate, and provide you with a summary.

The science that explains the patterns of ocean circulation and the distribution of property such as temperature and salinity. That is where we all started. Nansen, Fridtjof Nansen back in 1900 where physical oceanography really started, the Norwegian school. Somebody tried to figure out it what it means in terms of circulation, what all that means in terms of herring. But we go beyond that

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right now, and we look at currents, circulation of the water, waves, and the affects of those flows on the movement of sediments.

Of particular importance within this study, because you are asking me where the stuff is going to go is why this stuff going to go. It is going to go because you are exerting a certain force on it. We measure that force in terms of force per unit area, which we call stress. We are all stressed at some point. This is stress. Again, capisce? Go back to our friend Sister Sarsaparilla in the fifth grade or so, and she was telling you about forces, or flow going over a surface. A change in velocity as you are bringing a flow to a certain -- because you are beginning to reserve force in that circuit and you drag it along, and you may disaggregate it, and you may break it down. So you are going to hear a lot about boundary shear stress, because the boundary is where we are working, and the shear stress is the force that may affect, take a form and move it over a boundary.

This is a little primer I studied

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in the past that really doesn't work, but it is one you will see in all the texts. So it is up there for you to take a look at. It really was designed for the next set of terms you are going to hear a lot, using noncohesive sediments. The general class of noncohesive sediment which I believe we are all familiar with is beach sand, discrete, granular material, with very little binding beyond gravity. I will take questions on it later.

The materials that we deal with are for the most part cohesive. They may be fairly coarse grained, and you can get sand, but they are stuck together by other stuff than simply gravity. It may be the technical term snot as the interface, a mucilaginous matrix associated with biological activities along the boundary. You can actually stick sand together and cause it to be cohesive. But more typically what we are looking at is finer grain materials than sand. We get down well below the millimeters. We get down to the microns. 63 micron break over between silt and sand. Then you get down to about 4 microns or so and you get into the clays.

When you get down to the really fine grains, you not only have the possibility of having a mucilaginous matrix, but you also have electrochemical binding, differences in charge of the particles. Those little magnets, they stick together.

When you get down to that scale, and an awful lot of the material we are dredging tends to be fine grain silts and clays that are very cohesive, what you are looking at, in distinction from this picture that you have up here, where it is showing off an individual grain sitting up on top here, as you would with sand, really what you have is a matrix. It is all sort of glued together, and the stress tends to break down the bulk. It doesn't go off grain by grain. It tends to sit there until it was breaks down in bulk failure.

Another thing to consider when you are taking a look at the boundary is the effect of the boundary on the velocity field above the boundary, language. The boundary affects the velocity field, the flow right over that boundary. You can believe there is something up

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here. As we get closer down to the boundary, we get closer to more and more friction, the flow is going to slow down. That gradient in velocity as we get down closer to the boundary is the stress we are talking about. There are a variety of factors that are affecting it. That is all they are trying to show you here, and you have got a rather complex velocity field. That is the vertical. Here is the velocity coming down to the boundary. You see it over here, the velocity coming down to the boundary is rather complex because of some effects of the boundary on the flow. Another whole class to deal with that.

We sometimes have panels, and this is the famous Shields diagram showing something about particle characteristics against critical erosion velocity. The only thing you can take from this is there is a significant difference between the gluey, sticky cohesive stuff and the more granular noncohesive stuff. That is really all you need to get off this. We will see more of it as we go along.

A table summarizing some results, laboratory and field, shows you that as you go from course sands up through progressively finer materials, getting more and more cohesive, you have got a significant change in critical shear stress studies. We are looking out here at the stress, at the initiation, it is called the initiation of motion, first motion. We are getting into this in terms of Pascals. You are familiar with pounds per square inch, probably. You may have heard of millibars. That is pressure. We usually hear pounds per square inch in terms of atmospheric pressure. That tends to be a vertical pressure.

This is the same sort of thing, except it is horizontal. Pounds per square inch, force per unit area. We can put it out in a variety of units, but one of the most common units is Pascals. You can Google it up and see what it means. If you care for Dynes per square centimeter, you will find it at the back, and you can convert that to pounds per square inch.

But the game today, we are going to be playing mainly with Pascal, and the thing I want to call your attention to for part of the discussion at least later, is an interesting variation in this critical shear stress, Tau C, from point 4A up to a very high value, 18. This guy is circled out at about three quarters of a Pascal for something like fine sand. As you get finer and finer material, more and more cohesive, the critical stress goes up.

That is sort of counterintuitive. You believe in a kitchen if I have a pile of sand sitting on a counter and I blew on it, not much might move. But if I had a pile of flour sitting on the counter and I blew on it, a fair amount might move.

So she says why is it that the coarse grain stuff actually takes less force than the fine grain stuff. The answer is cohesion, it is stuck together. If you dammed up that flour, and if you have played with flour, you know you have got to sometimes scrub your hands pretty good to get rid of it, you will find that it is more difficult to move. So that is a bit counterintuitive, but it is also one of the reasons why you see so much dredged material sticking around.

MR. GASH: Are you taking

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questions now, or do you want us to wait?

DR. BOHLEN: Questions later. If there is something not clear up here, please. We have a critical value here, something like three quarters of a Pascal and it goes up. So there are some interesting responses that you can play with.

The objective of the physical oceanography study. The first thing is the Zone of Siting Feasibility, understand, is this blue guy right here.

It sort of goes from Gilford over to Medico, right out here. You have got long standing shoal and a fair piece of the Eastern Sound sitting in here. Montauk to Block, Block to Port Judith is the Zone of Siting Feasibility, ZSF, for this study.

The Environmental Impact Statement is going to be going around. This side is hard to read on either side. It shows you a number of the dredged material disposal areas. A couple of the active ones, the Cornfield and New London. You have got here a number of the historic ones. There are about six historic ones sitting in

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there, and there are about four new ones in there. You can see that down in the panel on the side here.

The purpose, stress. Describe the distribution of maximum bottom stress in magnitude as reflected in the zone. Characterize the circulation. Mind you, boundary shear stress is what gets this stuff moving. Then the circulation over the vertical is what transports it away from the initial point of introduction. Also recognizing that some amount of material is going to be interred in the water column when you dispose of the material. There will be a bit of a cloud. You care about the vertical circulation as well as the boundary shear stress. Acquire physical oceanography data sufficient to calibrate, verify the model. Clear, more or less?

Everybody knows where you are, right? Staten Island. You probably have some sense of the circulation in the Long Island Sound, right? If I tell you that it is tidally dominated, that is probably not too much of a surprise, I would hope. This is a set of

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stations that was occupied over the course of the Long Island Sound study. It started about 1988 and ran intensively in the early 1990s, and it has been going on. A fair number of stations are still monitored by DEP, and to some extent, DEC. The only one I want to call your attention to is this guy up here, which you can't read, and in fact, I couldn't read. I put a magnifying glass on it to determine that is M3 at the race, East River to the race.

You recognize that one of the factors affecting circulation in the Sound is fresh water inflows, that there is a regular seasonality to your fresh water inflows. This comes from the Connecticut River, which represents something in excess of 70 to 80 percent of the fresh water inflow to the Sound. So you get a feeling for the seasonality, peak in May, typically, snow melt up north. That is the assumption that there is a snow melt, but that is fairly typical, and a lull in the mid summer.

You see that I have got a tidal influence, and I can believe that we can make this a twice a month variation, and I have got a river influence, and it may displace some seasonal variations. We have got some temporal variations in the circulation of the Sound. They show up in water temperature. This is a set of slides that shows you the April, August and December temperature profiles. At the end, here is the East River below us, Throgs Neck over here. You get an idea that there is a deep seasonality in the temperature profile.

Again, it is all pretty much common sense. You have got to believe there may be a little bit of a time lag, but this afternoon, we are cooling down the water in the Sound. If you wait a while, it is going to get pretty cool out there. Then you are going to warm up Riverhead pretty quick. Coming through Long Island summers, you are going to warm quite so fast. You are going to get a big reservoir of heat sitting out there, or cold, the absence of heat.

Temperature, salinity, that change of fresh water inflow is going to show up in the salinity structures. Temperature, salinity characteristics affect the density of the water column. Just like the density of the air affects

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atmospheric circulation, the wind, the density of the water column will affect the circulation of the water column. Now we have tides and we have got this density field operating. This is just a picture of the tidal circulation from a model I found on the web. If you want to Google it up, you can take a look at this guy. A little hard to see, but what is important here is the spatial variations. Much lower velocities in the western sound versus the eastern sound. We have got a lot of velocity flow through the race. That is what you are seeing right up to here, and you can see fairly low velocities down here.

If I run through a tidal cycle, you can get an idea that it is coming and going. Move it back one, that is coming in. Still pretty strong flows in the eastern Sound in flood, and here is another flood, and here we go turning into the ebb. A little stronger on the ebb. Fair amount of spatial variation, fair amount of temporal, time, relatively short time scale, six to twelve hours, and then we drag that out to the monthly cycle.

Let's take a look at a little film.

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We will stop here for a second. This is not to impress you with the graphics, but here is the study area, right. If you look up on top, you will see a date. This is surface salinity that you are looking at.

MS. ESPOSITO: Is that this year, October 22nd this year? I can't read it.

DR. BOHLEN: This is October 22, 2012, for a period, but the detail detail is not as important as the nature of the enemy. You are dealing with a system. That is what is going on.

MS. ESPOSITO: Frank, is that just the surface?

DR. BOHLEN: That is the surface, that is surface salinity. Of course you can see the Connecticut River coming out here, and the ebb and the flood sweeping it around. You can see the variation from higher salinities off shore to progressively lower salinities as we come in. The technical salinity variation east and west in the Long Island Sound is about four parts per thousand. These guys are in units of hundreds of percent, hundreds. We call it 35 parts per thousand. You might call that 3 and a

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half percent. Salinities are normally marked out. On this guy here, you will see it goes 32, 31, 30, that is 3 percent salt. Oceanographers always deal with 4 points within a 31.445.

That is the system we are dealing with, sort of on average. If we keep running it long enough, actually, and it would take half an hour to tell you about how the system responded to Sandy, because October 29th was Sandy. We just walked by Sandy. Go back to the slide.

This just gives you an idea that not only are we worrying about spatial variations in temperature salinity, and some of the temporal variations that go along with them, but we also have to care about the waves. Surface waves have a velocity associated with them that interacts with the tidal and the density driven velocity field. So we have to worry about that, and this is just showing you two areas, one a little north of Montauk here, and the other sitting over here by Orient Point, and some of the wave characteristics as we wander down here. That is all you are looking at here. The significance of the blue and the red in this, we are not talking

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about that right now. That is actually a model run to compare, observed to a model. But what you are getting out of this is that there are some significant spatial variability in wave heights, as you start marching into the Sound. Again, not terribly surprising because of the sheltering and because of the shallows.

What is the distribution and spatial variations in the bottom stress, what are the regions in which the maximum stress are the smallest, and where, if the stuff does get stirred up, does it go. Sort of pretty fundamental questions. The model, Grant McCardell.

DR. MCCARDELL: Hello, everybody. I am Grant McCardell, also from the University of Connecticut. I am going to be talking some about the model we have developed to look at distribution of the stresses.

You saw an example of the model output just a few moments ago with that movie of the surface salinity. The reason we run models, as Dr. Bohlen stated, is because we are unable to go out there and make measurements over every

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single space at every single time. So we make some measurements at certain times, at certain locations, and we use those to be able to what we call tune a model. We then have to hope that the model is replicating reality, at least to a certain extent, in order to use the model to make predictions about what might or might not be the current during more extreme events, and in other locations. That is where we have areas.

The model that we are using is nested within a bigger model. It is nested within a model of the northeast coast and the northwest Atlantic. It is forced by tides, it is forced by observer floats, so we go and we get historic data, or get the model run from USGS stations.

It is forced by climatology, and by climatology here, what I am referring to is what are the average conditions at a given space and date. So the climatology for Riverhead, New York for today's date might be that the average temperature is 35 degrees, and that is what we were using. So that is what we mean by climatology terms.

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We also use climatology for the initial conditions. When you run a model, you have got to start somewhere, when we run this model long enough before the study period that is we are using the conditions for that actual period.

What is a model? The model that we call a primitive equation model, by primitive equation, we mean that it is based on first principles, it is based on Newton's laws that were developed in the 17th Century by Sir Isaac Newton. Those laws were further expanded to fluid dynamics in the 19th Century. It is a set of equations called the Navier-Stokes equations. Those are very well thought to represent fluid flow. They even model turbulence and all sorts of things. They are very rich sets of equations.

There are a rich set of equations that lend themselves to computer models. They did not lend themselves very well to analytic solutions in the 19th Century, but they have blended themselves very well to be able to use high speed numerical computers to represent these equations, and then simulate the motion of

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fluids. The same sets of equations are used in ocean models. They are also used in atmospheric models. So when you looked at the weather forecast this morning, it is because someone had brought a primitive equation model on the current conditions from yesterday, and extended that to be able to tell you what tomorrow is likely to be like.

In the model, the bottom stress magnitude which is what we are interested in here for the purposes of this study is computed according to the formula that you see down here. It is Tau equals Ro. Ro is the water density. Find CD. CD is just a constant. We normally take it to be point zero zero two five. It varies somewhat, but spatially, different studies vary. Then that is times the square of the water velocity. So in other words, if I double the water velocity, I increase the stress four fold. This also makes bottom friction non linear, which means that these models behave in a non linear fashion, which means that the models really are a pretty complex source of behavior.

Here is what our grid looks like to

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the bottom of your right. Again, this is nested within a bigger model that covers the rest of the shelf out here and then up to the northwest Atlantic, and this is our model. It contains about 30,000 triangular elements, each one of which contains 15 depth elements. So we have got a total of about 500,000 volume elements running this model.

In red right there, what I am showing is the area of our study. So red is the area of the study, and here it is to that red area. You can see that this model is made of discrete triangular mesh. It is important to realize that the resolution of this mesh is also the resolution of the output of this model. It is certainly much better than any survey we could ever do. We could not take a ship and survey every single one of those little triangles, nor could we go put buoys in every single one of those little triangles. But it is nevertheless of limited resolution. If we want even higher resolution than that because you want to know what is happening at Point Judith right at the pier, we can nest even finer triangles within this mesh. But it is impractical to use finer scale triangles over this domain, and we need to get the flow right over this domain to able to get the flows right at a finer scale.

So the current resolution is about 1 to 500 meters, which is about a quarter of a mile, which is a fine enough resolution to distinguish between potential dredge sites, but it is not a fine enough scale to talk about moving the boundary 100 feet east or west.

We wonder how does the model work. We have calibrated it. We have calibrated it using sea level heights, and we use sea level heights throughout Long Island Sound and New York Harbor. We also calibrated it using records of temperatures that we have, records of salinity that we have. As far as how well the models read, it really does quite well. I would call it state of the art in terms of oceanography readings. We have got Skills of 90 percent or better for sea level height, water currents, temperature and salinity.

With that, we are going to talk more now about evaluating a model compared to

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stress. Dr. Bohlen is going to talk more about that.

DR. BOHLEN: So you are a skeptic about this model stuff. We all are. We live with skepticism. A little bit of cynicism but a lot of skepticism. So we are going to go back out and we are going to measure at a discrete number of points. Deploy instruments, and the instruments are mounted on bottom frames. You will see them in a minute. We did talk about buoys, the buoy floats. There may be a little lobster pot to help us sort of find it, but the measurements that we are taking are bottom mounted arrays.

Here they are. Seven bottom mounted tripods, three two-month observation Campaigns to try to get a feeling for some of this time variation that we are seeing earlier. We know that we are never quite where we want to be. It used to get to be a curse if they see us walking down the dock and know there is a storm coming.

You would like to have it out there for a fair range of conditions, and you can

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believe that the conditions in the summer are somewhat different than the conditions in the winter, or the conditions during the seasonal transition, spring and fall seasonal transition are going to be different than the winter.

So we tried to pick three periods where a variety of conditions are going to be seen time wise. Then we are going to try site these seven stations that you see here in red, you can see they are in red, at a number of locations where we might expect to see differences in bottom shear stress. So we get a range of conditions, gather up that data and come back and use them to verify, evaluate the accuracy of the model. Clear?

Here are the periods. Our spring period is March through May. About each one of these is on the order of 60 days, you see everything. The spring period you saw on that river discharge chart is a time when you expect to see elevated river discharge, and it might be windy as well. For those of us that live on the water, the spring can be pretty windy around here. Then the summer, lower river flow, and

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again for those guys that are sailors, you know when it gets nice and warm, the wind dies. Generally lower energy. Come winter, lower river flow, but with high wind. So three Campaigns. You will see this Campaign number one, two and three.

Here are the frames. Pretty standard stuff today, with the exception of there is a little guy that sits down here that says Nortek, which is the manufacturer of acoustic doppler current profiler, ADCP. That is what you are going to hear a lot about in this study, but more and more, you are going to hear about it when people talk about measuring currents. We don't put a single current meter out any more. We actually have a single current meter at the bottom that allows us to take measurements of the whole of the vertical, or at the surface and take measurements over the whole of the vertical. Very, very useful tool.

This Nortek I said was a little bit revolutionary in the game. It is what they call a pulse coherent acoustic doppler current profile, meaning that you can make very small

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measurements. The RDI that sits up on top of the ADCP, that is the upper looking guy, that is measuring about once every meter over the vertical. The Nortek measuring centimeters over the bottom three quarters of a meter. So really fine slicing down to the boundary, which is what we care about. Remember? We really want to get those measurements down to the bottom. Grant showed you the equation, the square of the velocities, the east west velocity and the north south velocity. We are really able to measure those accurately right down to the bone, and we can with the Nortek. This thing also has a temperature salinity sensor sitting over here, and a couple of probes along here, and another one here that says OBS, Optical Back Scatter, so we can measure the concentration of stuff in the water column.

This will sample, burst sample maybe four times an hour a whole array for a couple of thousand samples. So you can get a lot of data on the structure of the flow both over the vertical, we are looking for far field affects over the vertical, and in terms of

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resuspension, the boundary shear stress at these points. They are discrete points, and that is what you are measuring; water column currents and waves, currents near the sea floor, stress, suspended sediment concentration and temperature and salinity. That frame stands about 6 feet high or so, and about 8, 10 feet triangular.

When we were out there working on the frames, changing batteries and so forth, we had to get out there, so you run a ship out from Avery Point to the stations. Along the way, you take temperature and salinity measurements at a number of points. This is a conductivity temperature depth profiler, profiling conductivity temperature depth, CTD, along with a series of bottles in here. So as you are lowering it down, you can take discrete water samples over the river, and bring those samples back. That allows you to calibrate your instruments. The OBS is an optical sensor looking at what is in suspension. How do you know that it really is telling you the truth? You draw some water samples, filter them down, compare them with the OBS. That is the water

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samples. You get your temperature and salinity from that. Sediment samples, for each station that we are doing the BP task, we will get a sediment graph. We will get an idea of the distribution of the sediment in the study area as well.

This is just showing you some of the track. It doesn't really mean very much because yesterday, the track didn't look like that, and tomorrow, it probably won't look like that again. You get from station to station, depending on how the weather goes.

The data recovery. That is an interesting slide. The data recovery is pretty good. You have three Campaigns, one, two, three in each of these boxes. The first guy shows you temperature salinity, and it shows you pretty much blue, which says full or near full data, greater than 50 percent. You have got a lot of temperature salinity there. You go out here and you say currents and suspended sediments near the sea floor. That is that Nortek ADCP. The most coherent guy is looking at the bottom 75 centimeters or so. You see the blues are in the

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middle guy, lighter blue here and yellow.

The first time we put this guy out, the manufacturer had claimed the certain life of the batteries. So we figured we would go out once at the beginning and once at the end of the deployment period, charge up the batteries. We went out there after about a week or two to check things out, and the batteries were bad. So that is why the Campaign One data recovery rate is somewhat lower than it was in the other Campaign.

Same thing goes for the two zeroes down here for ADCP's. This is now just telling you the problems of doing this kind of measurement. These two instruments were sent back to the manufacturer for refurbishment, and sent back all refurbished, ready to go with the wrong firmware. You put it in the field, and you get no data, that sort of thing. But overall when you are taking a look through this, you say the data recovery rates are well in excess of 50 percent, and probably bordering on 80 percent for a lot of the sensors.

DR. MCCARDELL: We did not expect to have that percent. 50 percent was what was

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anticipated.

DR. BOHLEN: A few years ago, if you got 10 or 20 percent, you would really be feeling good. Just some examples of the observations. This is mean flow, an average, near the bottom. This is the RDI, the ADCP that is looking up. You are 3 meters off the sea floor here, and this is the long term drift. This is not an instantaneous measurement, it is an average over many tidal cycles.

You can see it here, if you look carefully at these, you will see they are three different colors in every one of these. You can see in general, the mere bottom flow will generally drift into the Sound. It is a characteristic estuarine flow.

You have the higher density, saltier water at the bottom, and it tends to migrate into the estuary, as opposed to the characteristic fresher, lighter surface waters that tend to migrate out. The waters of Long Island Sound are not getting fresher and fresher as the Connecticut River water comes in, so where is it going? Out. You have got a characteristic

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in at the bottom under the surface, and that is what you are looking at here.

This is now at the premier level, and we are going to come all the way up for you. It is just that they picked 3 meters here. This is the Nortek now, about a half a meter from the sea floor. It is the same sort of thing. You get an idea of the magnitude. The magnitude is shown in here on the order of 10 centimeters a second once again. Capisce? 10 centimeters a second? Are you comfortable with 10 centimeters a second? You don't have to lie to me.

A nautical mile per hour, one knot, nautical mile per hour, 50 centimeters a second. Does that give you a feeling for what 10 is? Better? That is a mile per hour, sort of like in a car, a little bit more, 6,080 feet, instead of 5,000 and some. So just to give you an idea, 10 centimeters a second as the average drift, pretty slow. 3 centimeters a second is a foot per second. So that is the drift, that is the average drift. You stir this stuff up and it is going to go back and forth, back and forth, back and forth, and it is going to keep marching out

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at the surface. At the bottom, back and forth, back and forth, back and forth, marching in. On average, about 10 centimeters a second, the average flow rate. Clear?

This is just showing a little bit about the tidal amplitudes in that these are tidal ellipses for each of the Campaigns. Again, what you are seeing roughly, this is now over the vertical. The M2 is the principal lunar component of the tide. You will see that generally things are acting along the axis of the of the system, which is about what you would expect. You can get some idea of the magnitude on this whole thing. This is a graphic. That is about a half a meter per second over here. So you get an idea that you have on the order of a knot or so max flows down in here. As you get down further out in here, the velocities go down, which is what you are seeing ad nauseam. You saw it in the first model, you saw it in the trip model.

With the wave statistics, one of the things we are looking at here is the extent to which the waves are influencing bottom shear

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stress. One of the questions is always sensitive to areas that are going to be influenced by the waves. To make a long story short here, what these data are showing, there is a difference. In our bottom stress profiles in here, we are looking at time against the magnitude of the bottom stress. You will see this is the spring neap monthly cycle, the stress as you are looking at moving up here. Up here is time, and this is wave amplitude and varying over the period. What you would like to see, if there was a neat correlation between the two, is the influence of the wave on the bottom stress.

To make a long story short here, probably not surprisingly, there isn't much of a correlation, because the stations are, for the most part, outside of "the wave base," the area that you expect to be influenced by waves. Which makes sense because you want to set a site for disposable materials that is probably, for most of the sites, tends to have as few influences to move this stuff around as possible.

The guy on the bottom is showing you a relationship between velocity and the distance over the vertical, and it is just showing you there is a difference at the two sites as we are coming in here, at the two times as you are coming in here. This is another site looking at the same thing, and probably the same answer.

One of the things I didn't point out, and you may have missed on the very first slide that had the zone of citing feasibility, is around the margin of it was a gray border. That has been defined by the Army Corp and EPA as the area where you are too close to shore, and you may be more likely subject to wave influence. So that is looking pretty good so far from these data.

DR. MCCARDELL: Because it is shallower.

DR. BOHLEN: Because it is shallower. I thought that went without saying, right. Closer to shore is shallower.

MS. PURNELL: Is that set at 14 feet? Is the boundary set at 14 feet?

DR. BOHLEN: I don't know.

DR. HAY: 18 meters.

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DR. BOHLEN: 17, 18 meters.

MS. PURNELL: Thank you.

DR. BOHLEN: We can argue about the 17 or 18, but it is not going to affect it. This gets a little esoteric for you. This is the plot that Grant, when he was talking about the model formulation, he said he was going to be using a formula that had a drag coefficient in it, and he mentioned just sort of off hand, our drag coefficient, C sub d, is generally on the order of 0025. This was a plot to check out whether that made any sense or not. What we are taking a look at here is a log plot sitting along here. There is a log law down in here, and there is a bulk formula on here. If everything on the vertical bulk formula, on the horizontal log law, if everything was fine, it would be laying along a single line, a log law.

It looks pretty good on this, laying along a single line until you get up in the vicinity of about a Pascal. When you get up to a Pascal or so, that begins to break down a little bit. This is where the complications come in. Why four? Because all sorts of things at

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this point start influencing the characteristic of the near bottom velocity field, the velocity over the vertical, the boundary layer when you get down to there. When you begin to stir up sediment into the water column, you begin to change the relationships that govern the distribution of the velocity over the vertical, the friction characteristics of the flow change. You can also change the pressure distributions at the bottom as they affect the flow field.

That is being verified here really as you see, you get up here pretty well, and you begin to break off somewhere around, if you can see it, right around here. Then you get off and say how many things are going on. But the long and short of this one is that the measurements using the log law support the use of the bulk formula with a drag coefficient of about 0025, up to at least one Pascal.

I thought this was hard to see, and it may be that I am getting color blind as my age passes, but one of the things this is showing you is that model simulations reproduce tidal and the spring neap variations on the observed stress.

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You have got a neap, spring neap variation. Do you understand spring neap? Is that all right?

The monthly variations, twice monthly variations. We are near full moon tide right now. You drive down 25 this morning, this afternoon, and high water is pretty near the road. That is not counting what is going to happen when it is going to blow for the next day and a half. We get off the full moon, and the tidal experience is somewhat reduced. We get back on the new moon, and it is increased. That is the spring neap cycle. That spring has got nothing to do with May June either.

What you are seeing here is a variation over the course of about 14 days or so of a spring neap cycle. You can see, if you can see it, if the blues and the purples weren't so close together, that the model is doing an excellent job of reproducing the stress that is measured from the array.

DR. MCCARDELL: The model is in red, and the data is in blue.

DR. BOHLEN: You can see it down at the end in the blue. That is why they dove off the end down in here. There is no data out there. So we got a pretty good feeling for that.

Here, we are looking at a comparison between the measured and observed again. This is now the model, modeled and observed or modeled and measured. This is the model and this is the observed, and you can see if there was a perfect fit, a one to one fit, everything would be laying on this line right here. So it is just a slight variation for the means, these are the mean velocities now. Then for the max in here, it is a little coarser. The R squared is about point 7 in here. It is something over point 9 in the case of the means. But in the world of modeling versus measuring, those correlations are excellent. That is a high correlation. You are very happy with how well your model can do for you when you are talking about those kinds of values.

MS. PURNELL: Again, that data and the prior slide's data, that averages over all seven of those arrays? Is that how you came to that?

DR. BOHLEN: I had forgotten what

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I had on this one. Yes, it is.

DR. MCCARDELL: Yes, it covers the stress during the entire Campaign.

DR. BOHLEN: For all seven arrays.

DR. MCCARDELL: The maximum amount of stress during the entire Campaign.

DR. BOHLEN: Right. One of them, I had just one Campaign. Here is the analysis. Find the maximum bottom stress magnitude at each point in the Zone of Siting Feasibility in the three Campaigns, compare the values at sites identified in the screening process. That is the sites for potential disposal areas. Simulate the period and the characteristics that you might expect during a storm, and Sandy came to mind.

Here is the Bathymetry, water depths through the study area, and these are the stations, DOTs, groups, and the sites. You get an idea of what the water depths looked like through the system. Are you comfortable with that? Pretty deep into the vicinity of the arrays. Montauk through the square deep, shallow is here. Is that okay?

Stress values. Here are your

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stresses in Pascals. Reds are three, and that number that we were playing with in that panel before, point 75 or so, is somewhere down in the blues, down in here. So if we say that a fair amount of the area in the Zone of Siting Feasibility has got fairly high stress, that is what that guy is saying.

The one thing that is interesting is that the spatial differences, if we run this now for each of the Campaigns, and we can go beyond the Campaigns now that we have a model, we can run it every month if we care to, you are going to find that the spatial differences are much larger than the seasonal variations.

Which sort of makes sense because you figure that wind and wind waves are probably the primary factor affecting the turbulence over the vertical. We were seeing before that wind and wind waves have relatively little affect on bottom shear stress in the area that we are picking. You have got to get much closer to the beach to find that.

So to give you a sense of what the stresses look like, you are within a one and a half Pascals sort of range up in there. You get up into Fishers Island Sound or close to Fishers Island Sound, you are getting down to your point 7 or so. You get out into here, you get down around Montauk, you are up around 2 and behind Montauk.

Maximum bottom stress during storm conditions we observed through each of the Campaigns; one two and three. You can see this, we are allowed to go through this now and pick out different seasons, different locations. Cornfield is fairly high. That starts dropping down. This is Eastern Long Island Sound break out here, Six Mile Reef, Clinton, Orient Point, New London.

Then we go Block Long Island Sound, outside of Eastern Long Island Sound, however you want to divide it. Fishers, this is the south side of Fishers near the deep hole for Fishers. Values similar to Clinton. You can sit and play with this. This is the kind of information that you will have to play with as you go through. That just summarizes some of the sites against that plot you had before.

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Sandy. This should come as no surprise, the results from the Sandy analysis if you lived here during Sandy. You had some winds. This is now ledge, tip of Long Island Sound, west of Long Island Sound and the Bronx. You have got some winds that ledge, that might get up to 60 miles an hour. Is that a lot of wind? It is not an afternoon sailing breeze, not around here, but it is a fair amount of wind. But this is not the 100 year storm event, wind wise. It is just sort of a husky afternoon sailing breeze. You can get a 50 knot sully about every year, every other year.

MS. ESPOSITO: We are supposed to get 50 mile per hour winds tomorrow.

DR. BOHLEN: We might get 50 mile per hour winds tomorrow, so there you are, call me a liar. Again, any time you look at these things, you sort of scale them out, what do they look like, what do they feel like. Again, the impressive thing about Sandy that made it memorable was the surge, and the impressive thing about Sandy that made it memorable was the surge down towards New York. In this case, this is

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Kings Point, this is in Long Island Sound. In Kings Point, there is a surge up here on the order of 4 meters. We get down to the eastern end of things, on the order of one and a half to 2 meters.

So we have a pretty good surge down at our end. It has got a recurrence on the order of 30 to 40 years sort of a thing. When you get down to the western end of Long Island Sound and New York Harbor, you have got a recurrence interval of once every 1,000 years or so. That is what got the attention, besides 8 million people, to Sandy.

Superstorm Sandy, our analysis of that, running it in, created higher maximum amount of stresses in some areas, and most of those areas were closer to shore, sitting in here. If you ran this guy against the slide I showed you earlier, which was the results of the model that is running through every year, and no Sandy in that, you won't see an awful lot of difference. You will some spatial variability in areas where you would expect to see more reds up along the shallows. It makes sense.

Sandy was, for the most part, a southeasterly storm here. It went northeasterly as it got volume. Southeast, this way, east this way. That's when you have got your good winds and you have got some good waves and you have got some good stresses acting against, you all know what, residual flows. You stuff a lot of water down at the western end of the Sound, and it has got to go somewhere. It comes back out. It is the interaction of the tidal wave with the outflow of water that produces some interesting turbulence, and increases the change in boundary shear stress. So the picture here is fairly complicated, but it didn't turn everything red at all, is the model of this story. But I suppose you could find me a higher energy storm. Start looking around for it.

This is now the Superstorm Sandy conditions, and again, you are running these up against what we had before, and you see New London along on the eastern Sound and Cornfield, Six Mile. Six Mile is out in the water a little bit more, a little bit higher. These numbers aren't terribly much different than what we saw before. In fact, in some areas, you might see the stresses a little bit lower because of the complexity of the interaction of the flow.

We define a stress level based on historical data and literature. Based on a review, we chose point 75 Pascal as something of a designed threshold. You can make it higher, you can make it a little bit lower, you can sit and argue about it if this is a work in progress. But you have the data to progress, to do that sort of testing. The model is looking pretty good. The results of the model are impressive.

Critical shear stress, if you listened to what I told you before, the manner of setting up a critical shear stress for cohesive materials is complicated. It depends on grain sized fraction at play, volume fraction, how many burrowing organisms you have working that are sediment bound, how long the sediment has been down for consolidation. All of that affects bulk density, affects erodibility, and bulk density is very important in here.

The comparison of the maximum amount of stress for potential dredge material

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disposal site simulation in the three observing Campaigns and Sandy, throwing in Sandy, came out with this set of numbers. Cornfield one. Six Mile is next. Fishers Island west. This is south of Fishers Island near the deep hole was next. Then Niantic Bay and Clinton Harbor. You run down this guy, the New London disposal site is point 69. All of these guys here; Block Island, New London, Fishers Island Center, Orient, Fishers Island East and North of Montauk are less than the defined critical threshold, point 75.

What this guy is, is just a schmear of areas where the maximum amount of stress exceeds point 75. To give you an idea that it covers a fair number of the sites in the Eastern Sound, it covers a fair number of sites in the Eastern Sound, with the exception of the Fishers Island site down here. This is the kind of information that is coming in, that we often can come into the site selection designation.

So sites one, two and seven, Cornfield Shoals, Six Mile and Fishers Island. Everybody knows where they are, and Fishers

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Island is west, have high maximum stress. Four and ten, this is Orient Point and Block Island, the Block Island Sound site. Maximum stress is below at the center of the site, but have values in excess of point 75 Pascals at the boundary. So there is a spatial variation on the scale of a mile or so. Grant already told you that the resolution of the model might be on the order of a quarter of a mile or so.

Sites three and five, Niantic Bay and Clinton Harbor, maximum stresses, but less than one. The stresses are above point 75, but less than one. If you want to really hold me to point 75, you can make your one, you can argue about a quarter of a Dyne or so, a quarter of a Pascal or so, the issue gets interesting. The only disposal and the only site on the Eastern Sound with a maximum stress level below point 75. We saw that. Thank you. Questions?

DR. HAY: Before you have any questions, state your name, please, for the record, and also your affiliation.

MR. GASH: I am Bill Gash, Connecticut Maritime Coalition. Referencing back

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to one of your earlier slides when you were talking about shear out there, I have a letter from the State of New York objecting to consistency certification for dredge projects taking place in Mystic.

I just want to be clear on something. They state in their letter that sediments associated with that project were comprised almost entirely of fine grain, very small silty particles. I would imagine those are the same fines that you are talking about.

DR. BOHLEN: What fines?

MR. GASH: That all stick together, they are all glued together.

DR. BOHLEN: Yes, yes.

MR. GASH: They said given the high current velocities and unstable nature of sediments at and in the vicinity of NFDS, and the placement of the material from this proposal that contains large volumes of that very fine silt, adverse affects are anticipated at the site, adjacent areas as a result of the dredge material disposal activities. Can you comment on that at all? From what I am seeing from your

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presentation with the Pascals and the disposals, once the material has fallen, there is going to be some dispersion as they are falling. But as they get near bottom, everything pretty much settles down to less than point 75 shear in Pascals.

DR. BOHLEN: I really can't comment on it because I don't have the sediment data to look at. But seemingly the statement, at least the first part of the statement that you read, flies in the face of what I said about the erodibility of the materials that are progressively more cohesive. As you get down into the silt range of sediments, below 63 microns, the sediment, a sediment mass is very, very cohesive, and tends to get probably more cohesive looking, more cohesive as you add more clay particles.

The problem with any one of these about diagrams is they show you a single grain size. If I picked up that stuff out of my bucket and I said we did sediment grabs, full on grabs at each of the stations that we are doing CPD casts at, it would be shmuck on the deck. It

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would be quite cohesive and clay like. When you get an analysis, you find there is a range of particle sizes. So you might say the mean grain size is 50 microns. But you have got a lot of stuff that is down to two, and you may have a little bit of stuff, because we do the grain size, distribution by mass, so a few big particles can skew the mean a lot.

Most of the sediments that we are familiar with in Mystic River are exceedingly cohesive. This is all I can tell you. As far as the barge goes, that is another whole story. 45 years had us dining on the New London disposal site. The sea story in that is that this was material that was being dredged from the Thanes River for the channel up to the submarine base, the channel from the mouth of the river up to the submarine base. If you look, it is being put into dredge by clamshell dredge and put into 2,000 cubic yard hopper barges. The barge would go out and they would open the bottom door and down goes the stuff.

We would go down after a while, I am not going into going down, but we would go

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down after a while for a swim. Any number of pieces of that stuff on the bottom retained the teeth marks from the clamshell bucket. When you drop that stuff in the water, there is a gravity flow. It goes down like a brick, vertically, and it retains its cohesive character until lobsters drill holes in it. That is another story.

DR. HAY: Any other comments, any questions?

MS. PURNELL: Marguerite Purnell.

DR. HAY: Do you want to state your affiliation.

MS. PURNELL: Fishers Isle. The information that is presented today, is it on the web site yet?

DR. BOHLEN: No.

MS. PURNELL: Will it be posted on the web site as one of our presentations?

MS. BROCHI: It will, and when we post information, we are going to send an E-mail notification so everybody knows that it will be available. Because there is just a lot of material.

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DR. BOHLEN: You could try one.

MS. BROCHI: She already asked one.

DR. BOHLEN: That is okay. She can ask one other question.

MS. PURNELL: I appreciate the physical oceanography component to it, and there is a lot of meat in there to really think about. Have you made any effort to correlate that with the prior physical oceanography that was done in the prior designation for western Long Island Sound and Central Long Island Sound since there were data points in the Eastern Long Island Sound for the site feasibility as well. I was just wondering whether or not you have looked at the consistency of the data and the findings as of yet.

DR. BOHLEN: I am not exactly sure what you are asking. Because as I showed you, I think, you are going to expect a fair amount of difference in the transporter regime in the central and western Sound, where we have worked before, but not on the siting study. Me,

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not on the siting study.

I have worked on other parts of the Sound, so there is a significant difference in the transport system in the Central Sound, Western Sound versus the Eastern Sound.

MS. PURNELL: I concur.

DR. BOHLEN: You can believe it just from an energetic standpoint, you saw all of those arrows, the blue arrows, the white arrows we showed you on the model. Then of course there is the matter of it being open to the world ocean out there from the southeast. It is a much more energetic system. The comparison between the two I am not so sure is germane to this question.

MS. PURNELL: The comparison is germane in the sense that there was a large chunk of data in the physical oceanography report that dealt with the Eastern Long Island Sound. I apologize if that did not come across in my question.

DR. BOHLEN: Anything that dealt with the Eastern Long Island Sound we have seen. Of course, the other thing is we did the report that is in the Long Island Sound volume on the

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physical oceanography of Long Island Sound. We saw some of the slides from that report up here. So we are looking at all of that, and that will all be brought together. I think the thing that is impressive on this from the standpoint, again, from the history of disposal in the Sound is you have got more site specific measurements in this study than you had in any other study already.

There are seven frames out there, and the effort to tie all that together, and verify, calibrate and redesign the model has been substantial, leaving you with a very powerful tool to be used for any use out there, really. It is a substantial foundation to resolve the issue.

MS. PURNELL: The data point that was closest to the New London dump site, you based some of your findings on that. Where is that related to the position of the current outline of the dump site? Is it in it or is it to the northwest or is it to the southwest? Given the resolution of the slide, it is hard to figure.

DR. BOHLEN: Why don't we look

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on here as to exactly where it is. I will put the slide up and show you.

DR. MCCARDELL: I should add that the seven sites that we used for the surveys were chosen to represent the maximum variability that we would see within this entire domain as an attempt to get the model as good as we could. They were not chosen to represent any specific site, because we are legislated to be able to consider all possible sites. If we give undue credence to one site, we would have measurements at one site and not others.

MS. PURNELL: Thank you.

DR. MCCARDELL: I hope that explains a little bit.

MS. PURNELL: Thank you.

DR. HAY: Thank you. Other questions?

MR. MCALLISTER: Kevin McAllister, Defend H2O. That was very thorough. Thank you, Doctor. Forgive me if I am missing something, but this component with this oceanography, we are really focusing on dispersal, the biological implications as defined, I guess, at least in

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part with the environmental consequences. Was that another part? Am I missing something?

DR. BOHLEN: No biology.

MR. MCALLISTER: No biology. Of course, certainly I understand that part, but where is the biology?

MS. BROCHI: This is one part of the site screening. This is the physo component. There is a biological component as well. Biological characterization will be done combined with this physo model to model sediment transport as well.

MR. MCALLISTER: Will you be back in town to share this information with us?

MS. BROCHI: We will share the information, but we don't know the dates. Again, whenever anything is posted on the web site, we will notify you ahead of time. While this physo presentation is fresh in your mind, we will have it available probably next week. We will send out notification and have the presentation up, so yes. It is a multi faceted process, so it has many components going on, and we have contractors putting it together as we speak.

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MR. MCALLISTER: As I understand, if I am not mistaken, was it the environmental consequences document that seems to be the bulk of the biology? That is at least what I saw so far as being represented. Is that correct?

MS. BROCHI: I am not sure what you mean by "environmental consequences."

DR. HAY: Do you mean the SEIS, the Supplemental Environmental Impact Study?

MR. MCALLISTER: No, there was another document that I had viewed, environmental consequences document.

MS. BROCHI: I am not familiar with the environmental consequences document, but if you remember it or you can reference it, send an E-mail to any of us, actually, or ELIS@EPA.gov e-mail, and we can get back to you.

DR. HAY: The environmental consequences document will be part of the SEIS.

MR. MCALLISTER: Chapter five, environmental consequences.

MS. BROCHI: All right. I thought you were looking at something.

MR. MCALLISTER: Thank you.

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MS. BROCHI: There is also a no action alternative as part of this effort. So it is looking at sites, but is also looking at what happens if there is no site.

DR. HAY: Okay then. Other questions, comments?

DR. BOHLEN: We are pretty easy to find. BOHLEN@UCONN.EDU, or you can just take a look at the University of Connecticut and see the faces in here. If there are questions, we are happy to answer them.

MR. MCALLISTER: May I make a request with respect to our sign in? Would it be possible to provide some contact information to the attendees here via E-mail?

MS. BROCHI: Sure.

MR. MCALLISTER: Because a couple of those slides that were identified went by very quickly.

DR. BOHLEN: I'm sorry, a couple of the slides --

MR. MCALLISTER: A couple of the slides that identified the presenters and who was being represented today, that went very quickly.

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I didn't get names and contact information.

MS. BROCHI: Sure, we will get that out. We will do that in the notification when we post the information on the web site.

MR. MCALLISTER: Thank you.

DR. HAY: The names of the presenters is also on the agenda.

A SPEAKER: Just an anonymous question. Who is responding to these requests?

MS. BROCHI: Several of us at the Region I office.

DR. HAY: Thank you. Other questions?

MS. ESPOSITO: Adrienne Esposito, Citizens Campaign for the Environment. Just for clarity, the University of Connecticut is contracted out by the EPA to do this work?

DR. BOHLEN: No.

MS. BROCHI: They are contracted for the project, and the contract is through Connecticut University, and contracted through the CT DOT for EPA.

MS. ESPOSITO: Okay, but contracted for this project.

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MS. BROCHI: Yes.

MS. ESPOSITO: I understand.

DR. BOHLEN: You heard about a whole bunch of other things, and we may or may not involved in those.

DR. HAY: Other questions? Going once, twice? Last chance? I will adjourn the meeting now.

(TIME NOTED: 4:25 P.M.)

CERTIFICATION

I, Robert J. Pollack, a Notary Public in and for the State of New York, do hereby certify:

THAT the foregoing is a true and accurate transcript of my stenographic notes.

IN WITNESS WHEREOF, I have hereunto set my hand this 13th day of December 2014.

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ROBERT J. POLLACK